Prerequisites for developing a safety culture

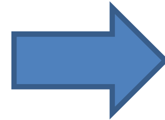
Dr Nektarios Karanikas

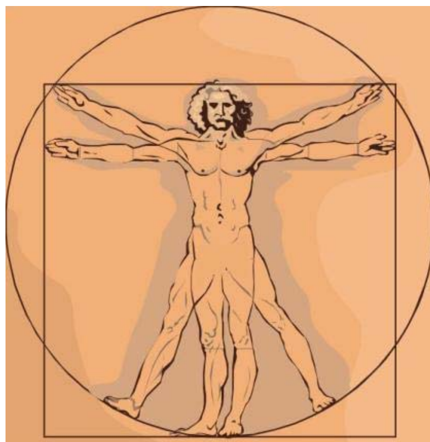
Associate Professor of Safety & Human Factors

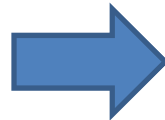
Amsterdam University of Applied Sciences / Aviation Academy

From Simplicity to Complexity

Photo by Harry & Ewing courtesy of The Library of Congress







Safety Management Systems

Safety Management Systems and Safety Culture

How can we develop Safety Culture as part of an SMS, and how will Safety Culture influence the success of our SMS?

Reason's decomposition of safety culture

How can we operationalise the subcultures?*

In what order should we develop the subcultures?

*Karanikas, N., Soltani, P., de Boer R. J. & Roelen A.L.C. (2016). Safety Culture Development: the Gap Between Industry Guidelines and Literature, and the Differences Amongst Industry Sectors, in Arezes, P. (ed.), Advances in Safety Management and Human Factors, Proceedings of the AHFE 2016 International Conference on Safety Management and Human Factors, July 27-31, 2016, Walt Disney World®, Florida, USA, Springer.

The suggested order of development

Common prerequisites → Just culture → Flexible culture → Reporting culture → Informative culture → Learning culture

Safety culture in aviation standards*

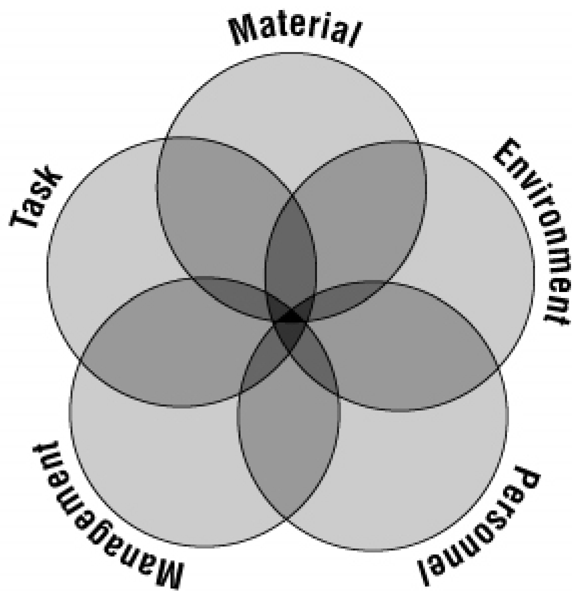
All markers	General prerequisites	Just	Flexible	Reporting	Informative	Learning
69%	64%	40%	67%	86%	75%	83%

*ICAO. Safety Management Manual, International Civil Aviation Organization, Canada (2013).
*CANSO. Safety Culture Definition and Enhancement Process, Civil Air Navigation Services Organisation, Amsterdam (2008).

Just Culture: The role of the Authorities

- Presence of Just Culture is actually tested after accidents.
- Companies efforts to establish a just culture might be undermined if national authorities:
  – Do not investigate safety events with adequate depth and extent
  – Do not state the assumptions and limitations of the investigations
  – Focus on the lowest levels of operations

New Safety Thinking: Opportunity for Improvement



Investigate

Justify

Create

New Safety Thinking Aspects*

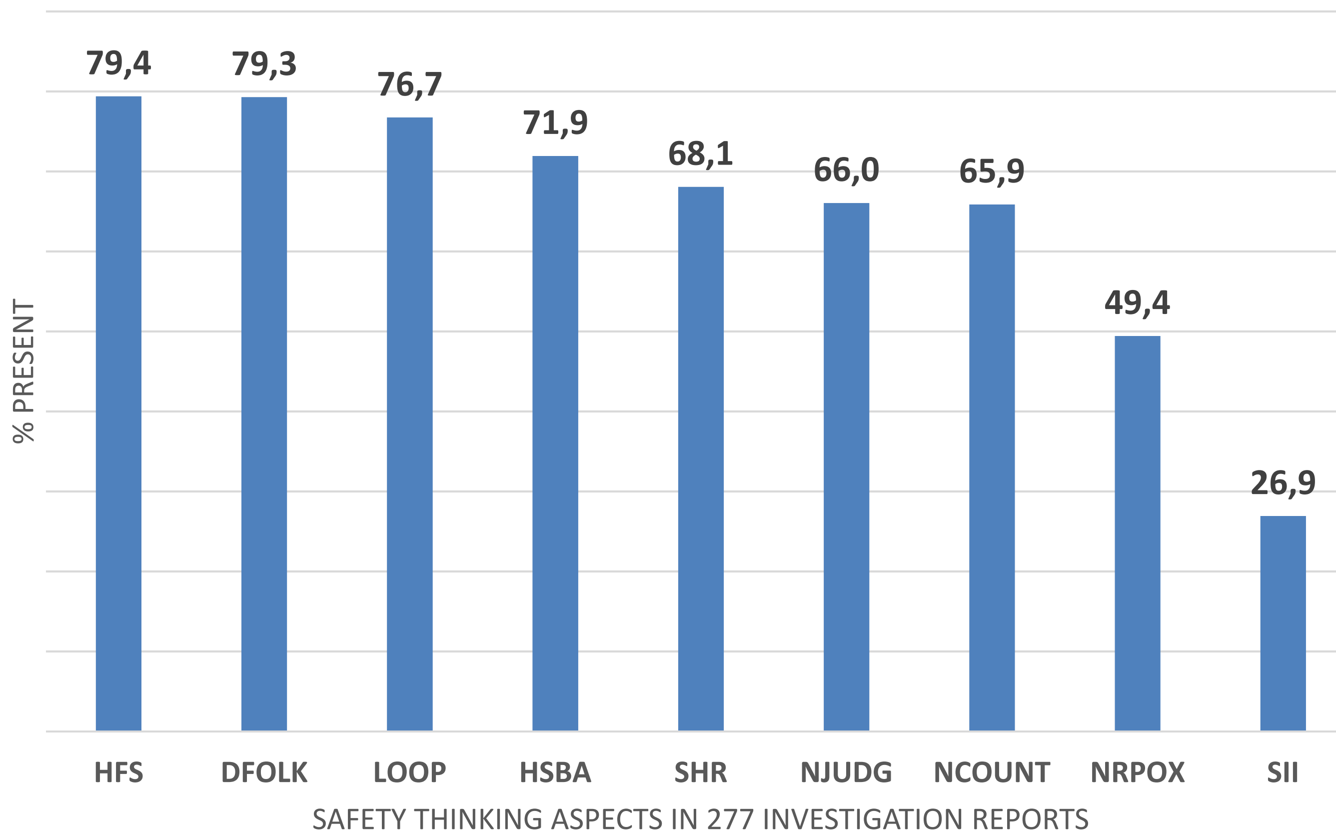
- Approach human error as a symptom
- Understand what made sense to users and what options they had.
- Recognise shared responsibility under a non-proximal approach.
- Decompose folk models and psychological constructs.

*Karanikas, N. (2015), Human Error Views: A Framework for Benchmarking Organizations and Measuring the Distance between Academia and Industry, Proceedings of the 49th ESReDA Seminar, 29-30 October 2015, Brussels, Belgium

New Safety Thinking Aspects

- Explain why people deviate from standards; examine quality of standards.
- Explore why people do not meet expectations; examine validity of expectations.
- Identify successes during and before the event.
- Examine whether/how system control was maintained.
- Investigate dependencies and interactions; do not focus only on component failures.

New Safety Thinking Embracement



HFS: Human error as symptom
DFOLK: Decomposition of folk models
LOOP: Assessment of control mechanisms
HSBA: Hindsight bias avoidance
SHR: Shared responsibility
NJUDG: Non judgmental
NCOUNT: Non counterfactual
NPROX: Non proximal
SII: Identification of success

New Safety Thinking Embracement

ACCIDENT MODELS USED IN 277 INVESTIGATION REPORTS

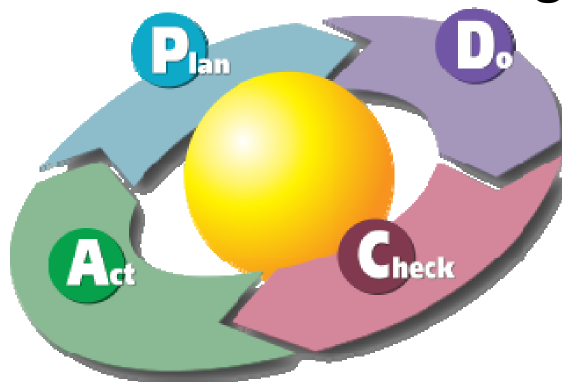
Model	Share
EPIDEMIOLOGICAL	52,7%
CHAIN OF EVENTS	44,0%
SYSTEMIC	3,2%

Differences in Safety Thinking

Safety Thinking Aspect	Authorities (total 277 investigation reports)				
	ATSB	**DSB**	**TCA**	**UK CAA**	**NTSB**
Hindsight bias avoidance	93%	46%	55%	78%	82%
Shared responsibility	77%	59%	45%	75%	85%
Identification of success	53%	14%	13%	28%	30%
Non proximal	75%	54%	20%	38%	70%
Accident Model (Epidemiological)	69%	51%	45%	76%	36%

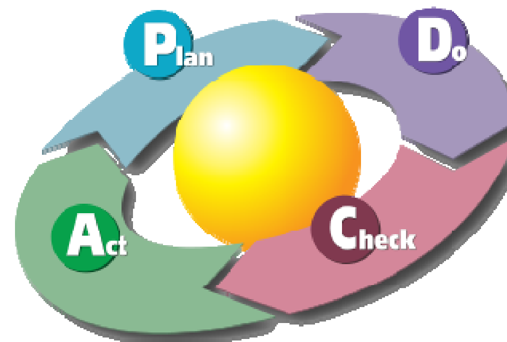
Recommendations: Safety Culture

- Organizations can prioritize their efforts for safety culture development and improve their SMS by:
  1. Ensuring maintenance and valid assessment of the safety culture markers included in their plans
  2. Decide and justify which markers they want to introduce further
  3. Develop gradually and monitor the selected set of markets with the order of subcultures suggested



Recommendations: Safety Thinking

- Organizations and authorities can derive valuable lessons and support a just culture by:
  1. Assessing the level they embrace new safety thinking
  2. Setting own goals for changing views on safety and human error
  3. Train their staff in recognizing and applying selected new safety thinking aspects
  4. Demonstrating new views on safety & human error in day-to-day activities



Some last remarks

- SMS was introduced to address and not to increase complexity.
- A bureaucratic approach to SMS ensures compliance, but compliance does not equal to safety.
- Safety culture and thinking are not fostered through paper work. We must walk-the-talk.

Prerequisites for developing a safety culture

Thanks! Questions?

Dr Nektarios Karanikas

Associate Professor of Safety & Human Factors

Amsterdam University of Applied Sciences / Aviation Academy

Contact: n.karanikas@hva.nl

AVIASSIST FOUNDATION

Independent | Non-profit | Innovative

Safety in African Aviation Conference 2016